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DRAWINGS ATTACHED

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(54) SCREWS AND BOLTS

(71) I, GUTHRIE WILLIAM GIFFORD, of "Furtherside", Thornhill Road, Streetly, Sutton Coldfield, Warwickshire, a British Subject, do hereby declare the invention for which I pray that a Patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to screws and bolts and has as an object to provide a screw or a bolt in a convenient form.

According to the invention a screw or a bolt for use, in conjunction with a threaded hole, comprises a screw-threaded shank, a head at one end of the shank for engagement by a tool, a boss at the opposite end of the shank, and a coating of plastically deformable material on the boss, whereby the screw or bolt can be retained in a complementary threaded hole by engagement of the coating with the hole.

Reference is now made to the accompanying drawing which shows the application of an example of the invention to an ISO metric screw or bolt, the drawing being a diagrammatic section to show the relative dimensions of the screw and the co-acting threaded hole.

Referring to the drawing, the screw 1 has a threaded shank with a standard ISO metric medium fit thread. Full details of the thread dimensions, tolerances etc., can be obtained by reference to British Standards 3643 Part 1 (1963) and 3643 Part 2 (1965). Briefly, however, the screw has a major diameter D somewhat smaller than the nominal screw size. The flanks of the thread are inclined at an angle of 60° to one another and the major diameter is the diameter at which the flanks are spaced by one-eight of the pitch of the thread. The minor diameter C is measured where the flanks are spaced by one quarter of the pitch.

Purely by way of example an ISO metric medium fit screw of nominal 5mm diameter will have major diameter D in the range 4.82 to 4.976mm and a minor diameter C in the range 3.842 to 3.995mm.

Such a screw can co-act satisfactorily with a threaded hole 2 of major internal diameter A and minor internal diameter B. Such diameters are again measured where the flanks of the thread are spaced by one-eight of the pitch and one quarter of the pitch respectively. A 5mm tapped hole would have a minor diameter B in the range 4.134 to 4.334mm.

The end of the shank of the screw 1 is formed with a boss 3, which consists of a core 4 integral with the shank and a coating 5 of wax or any other suitable deformable material. The diameter E of the boss core 4, which is coaxial with the shank, is not greater than the minimum minor internal diameter of the hole 2 permitted by the standard specification. Thus for a nominal 5mm screw the spigot core diameter should be less than or equal to 4.134 millimeters. In practice a diameter E in the range 4.084 to 4.134 will suffice. The thickness of the wax coating 5 is sufficient to make the total diameter of the boss 3 greater than the maximum permissable minor diameter of the tapped hole 2. In the specific case mentioned therefore, the waxing coating should exceed 4.324—4.084mm i.e. .125mm. In practice a coating of thickness in the range .15 to .25mm would be satisfactory. The length of the boss should be sufficient to ensure that it is stably received by the co-acting hole. A length in excess of three pitches of the thread will normally be acceptable.

The manufacture of the screws 1 with the bosses 3 is not an unduly difficult proposition. The screws are collected from the thread rolling machine and caused to run along a track passing over a container filled with the wax, so as to dip the bosses into the wax. The heat generated by the thread rolling operation will make the screws sufficiently hot to keep the wax at a temperature slightly above its melting point. Additional heat can, of course, be applied if required.

In use, a screw 1 as described can be very easily engaged in the complementary screw threaded hole 2 by insertion of the boss 3. The screw 1 can then be released whilst any other screws involved in a particular assembly job

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are similarly engaged or whilst other operations are carried out. As a result of the push fit, there is little danger of the screw 1 becoming misplaced, whatever its orientation. When desired the screw threads can be interengaged using a screwdriver or other tool suitable for the head of the screw. The boss 3, by correctly aligning the screw or bolt with the screw threaded hole, also substantially reduces the possibility of cross threading.

The invention will now only materially speed up assembly operations, but also is of particular advantage when the screws are used in positions to which access is gained only with difficulty. Screws, can for example, simply be located in and driven upwardly into overhead tapped holes.

It will be appreciated that the ISO metric thread is quoted purely by way of example. The invention can be applied to all types of thread provided that the prescribed tolerances are correctly taken into account when choosing the diameter of the boss core and the thickness of the coating.

WHAT WE CLAIM IS:—

1. A screw or a bolt for use in conjunction with a threaded hole and comprising a screw-threaded shank, a head at one end of the shank for engagement by a tool, a boss at the opposite end of the shank, and a coating of plastically deformable material on the boss, whereby the screw or bolt can be retained in a complementary threaded hole by engagement of the coating with the hole.

2. A screw or a bolt as claimed in Claim 1 in which the said coating is formed of wax.

3. A screw or a bolt substantially as hereinbefore described with reference to and as shown in the acompanying drawing.

MARKS & CLERK.

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1204853 COMPLETE SPECIFICATION
1 SHEET *This drawing is a reproduction of the Original on a reduced scale*